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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of: **KAWAHARA, Yasuyuki, et al.**

Group Art Unit: **1797**

Serial No.: **10/524,843**

Examiner: **GOLOBOY, James C.**

Filed: **February 17, 2005**

P.T.O. Confirmation No.: **1074**

For. **LUBRICATING OIL FOR BEARING**

SUBMISSION OF DECLARATION UNDER 37 C.F.R. Section 1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Date: October 30, 2008

Sir:

Submitted herewith is an executed Declaration under 37 C.F.R. Section 1.132, the unexecuted version of which was previously submitted along with a Response under 37 CFR §1.116 and a Notice of Appeal filed on October 14, 2008. In view of the foregoing, Applicants petition the Commissioner for Patents to act on the subject application, as it is now in condition for allowance and early notice to that effect is earnestly solicited.

In the event that any additional fees are due in connection with this paper, please charge our Deposit Account No. 01-2340.

Respectfully submitted,

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PATENT & TRADEMARK OFFICE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of :
Yasuyuki KAWAHARA et al.

Appln. No. 10/524843 Group Art Unit: 1714

Filed: 17/02/2007 Examiner: GOLOBOY, JAMES C

For: LUBRICATING OIL FOR BEARING

Commissioner of Patents
PO Box 1450
Alexandria, VA 22313-1450
Sir:

DECLARATION UNDER 37 C.F.R.Section 1.132

Sir :

I, Yasuyuki KAWAHARA, do hereby declare that:

1. I am a Japanese citizen, residing at 203, 6, 16, Nishiura, Gokasho, Uji-shi, Kyoto 611-0011 Japan.

2. I graduated from Department of Chemical Faculty of Engineering, Gifu University, in March 31, 1990 also graduated from the graduate school of Gifu University and received a Doctor's degree in Material Engineering Division in March 31, 1996.

3. I began my employment with New Japan Chemical Company Limited, the assignee of the above-identified application in April 1 1992. Since January 10, 1995, I have been engaged in the research and development of lubricating oils.

4. I am one of the named inventors of the above-identified application, and am familiar with the subject matter of said application as well as the disclosures in the cited references.

5. The experiments given below were carried out under my general direction and supervision.

<u>**Experiment III**</u>

(1) The procedure of Production Example 1 was repeated with the exception of using 177.0 g (1.5 mol) of 2-methyl-1,5-pentanediol (manufactured by New Japan Chemical Co., Ltd.) instead of 3-methyl-1,5-pentanediol, giving 488.8 g of 2-methyl-1,5-pentanediol di(n-octanoate).

The total acid number of the thus obtained ester was 0.01 (mgKOH/g), and an FT-IR analysis showed that absorption due to carboxyl groups had disappeared and ester absorption was observed, and, therefore, it was confirmed that the resulting ester was a diester.

(2) The procedure of Production Example 1 was repeated with the exception of using 177.0 g (1.5 mol) of 2-methyl-1,5-pentanediol (manufactured by New Japan Chemical Co., Ltd.) instead of 3-methyl-1,5-pentanediol, and using 488.2 g (3.09 mol) of n-nonanoic acid (manufacture by Wako Pure Chemical Industries, Ltd., reagent, " pelargonic acid") instead of n-octanoic acid, giving 525.6 g of 2-methyl-1,5-pentanediol di(n-nonanoate).

The total acid number of the thus obtained ester was 0.01 (mgKOH/g), and an FT-IR analysis showed that absorption due to carboxyl groups had disappeared and ester absorption was observed, and, therefore, it was confirmed that the resulting ester was a diester.

(3) The procedure of Production Example 1 was repeated with the exception of using 156.0 g (1.5 mol) of 2-methyl-1,4-butanediol (manufactured by Sigma-Aldrich Japan K.K., reagent) instead of 3-methyl-1,5-pentanediol, giving 470.0 g of 2-methyl-1,4-butanediol di(n-octanoate).

The total acid number of the thus obtained ester was 0.01 (mgKOH/g), and an FT-IR analysis showed that absorption due to carboxyl groups had disappeared and ester absorption was observed, and, therefore, it was confirmed that the resulting ester was a diester.

(4) The procedure of Production Example 1 was repeated with the exception of using 156.0 g (1.5 mol) of 2-methyl-1,4-butanediol (manufactured by Sigma-Aldrich Japan K.K., reagent) instead of 3-methyl-1,5-pentanediol, and using 488.2 g (3.09 mol) of n-

nonanoic acid (manufactured by Wako Pure Chemical Industries, Ltd., reagent, "pelargonic acid") instead of n-octanoic acid, giving 506.9 g of 2-methyl-1,4-butanediol di(n-nonanoate).

The total acid number of the thus obtained ester was 0.01 (mgKOH/g), and an FT-IR analysis showed that absorption due to carboxyl groups had disappeared and ester absorption was observed, and, therefore, it was confirmed that the resulting ester was a diester.

(5) The diesters obtained in (1) to (4) were used to prepare Lubricating Oils 8 to 11 with the proportions (parts by weight) shown in Table III.

More specifically, Lubricating Oil 8 has the same composition as that of Example 4 with the exception of using the diester of 2-methyl-1,5-pentanediol with n-octanoic acid obtained in (1) instead of the diester (diesters of 3-methyl-1,5-pentanediol with n-octanoic acid) of Example 4.

Lubricating Oil 9 has the same composition as that of Example 4 with the exception of using the diester of 2-methyl-1,4-butanediol with n-nonanoic acid obtained in (2) instead of the diester (diesters of 3-methyl-1,5-pentanediol with n-octanoic acid) of Example 4.

Lubricating Oil 10 has the same composition as that of Example 4 with the exception of using the diester of 2-methyl-1,4-butanediol with n-octanoic acid obtained in (3) instead of the diester (diesters of 3-methyl-1,5-pentanediol with n-octanoic acid) of Example 4.

Lubricating Oil 11 has the same composition as that of Example 4 with the exception of using the diester of 2-methyl-1,4-butanediol with n-nonaic acid obtained in (4) instead of the diester (diesters of 3-methyl-1,5-pentanediol with n-octanoic acid) of Example 4.

(6) The obtained lubricating oils were tested for kinematic viscosity, total acid number, friction coefficient, wear scar diameter (mm), metal compatibility, and heat resistance (evaporation amount) in the same manner as described on page 42, line 9 to page 43, line 23 of the specification as filed. Table III shows the results. For ease of comparison, Table I of the Declaration filed on January 2, 2008 (hereinafter, referred to as Declaration 1) is included.

Table I

		lubricating oil 1	lubricating oil 2	lubricating oil 3	lubricating oil 4	Example 2	Example 3	Example 4
(a) Component	MPD di(n-hexanoate)	100	99.0	96.95	96.89			
	MPD di(n-octanoate)					99.0	96.95	96.89
(b) Component	A: MBDBP		0.50	0.50	0.50	0.50	0.50	0.50
	B: DBPC							
	C: Vanlube81							
	D: VanlubeDND		0.50	0.50	0.50	0.50	0.50	0.50
(c) Component	H: Palmitic acid			0.051	0.051		0.051	0.051
	I: Stearic acid							
	J: TCP			2.04	2.04		2.04	2.04
(d) Component	M: BT				0.051			0.051
	N: Propyl gallate							
	O: Lauryl gallate				0.01			0.01
Lubricant Properties	Kinematic Viscosity (mm^2/s) 0℃	16.5	17.7	18.5	18.7	29.0	31.0	30.7
	40℃	4.93	5.08	5.21	5.23	7.40	7.61	7.61
	100℃	1.79	1.80	1.82	1.82	2.42	2.43	2.44
	Viscosity Index	-	-	-	-	166	156	160
	Total Acid Number	0.01	0.01	0.14	0.43	0.01	0.12	0.38
	Friction Coefficient	0.38	0.25	0.11	0.12	0.19	0.12	0.12
	Wear scar diameter (mm)	0.48	0.49	0.46	0.46	0.42	0.35	0.35
	Metal Compatibility	-	4.10	0.18	0.08	0.85	0.18	-0.12
	Heat Resistance (Evaporation Amount %)	80.1	38.3	37.6	37.7	5.8	5.3	5.3

MPD: 3-methyl-1,5-pentanediol
MBDBP: 4,4'-methylenebis-2,6-di-t-butylphenol
DBPC: 2,6-di-t-butyl-p-cresol
Vanlube81: p,p'-dioctyldiphenylamine
VanlubeDND: di(nonylphenyl)amine
TCP: tricresyl phosphate
BT: benzotriazole

Table III

		lubricating oil 8	lubricating oil 9	lubricating oil 10	lubricating oil 11
(a) Component	2-MPD di(n-octanoate)	96.89			
	2-MPD di(n-nonanoate)		96.89		
	1,4-MBD di(n-octanoate)			96.89	
	1,4-MBD di(n-nonanoate)				96.89
(b) Component	A: MBDBP	0.50	0.50	0.50	0.50
	B: DBPC				
	C: Vanlube81				
	D: VanlubeDND	0.50	0.50	0.50	0.50
(c) Component	H: Palmitic acid	0.051	0.051	0.051	0.051
	I: Stearic Acid				
	J: TCP	2.04	2.04	2.04	2.04
(d) Component	M: BT	0.051	0.051	0.051	0.051
	N: Propyl gallate				
	O: Lauryl gallate	0.01	0.01	0.01	0.01
Lubricant Properties	Kinematic Viscosity (mm^2/s) 0℃	34.4	43.7	29.5	36.6
	40℃	8.15	9.77	7.25	8.68
	100℃	2.50	2.86	2.29	2.65
	Viscosity Index	143	151	137	153
	Total Acid Number	0.35	0.34	0.32	0.36
	Friction Coefficient	0.11	0.12	0.12	0.12
	Wear scar diameter (mm)	0.48	0.45	0.46	0.45
	Metal Compatibility	-0.09	-0.11	-0.09	-0.10
	Heat Resistance (Evaporation Amount %)	4.9	2.1	5.5	4.5

MPD: 3-methyl-1,5-pentanediol
2-MPD: 2-methyl-1,5-pentanediol
1,4-MBD: 2-methyl-1,4-butanediol
MBDBP: 4,4'-methylenebis-2,6-di-t-butylphenol
DBPC: 2,6-di-t-butyl-p-cresol
Vanlube81: p,p'-dioctyldiphenylamine
VanlubeDND: di(nonylphenyl)amine
TCP: tricresyl phosphate
BT: benzotriazole

Consideration

(a) As shown in Table 1 of Declaration 1, when the lubricating oils of Examples 2 to 4 are compared with Lubricating Oils 2 to 4 (containing diesters that are identical in diol-based structure, but different in terminal ester structure from those of the lubricating oils of Examples 2 to 4, and other components being the same), the lubricating oils of Examples 2 to 4 have heat resistance (evaporation amounts) ranging from 5.3 to 5.8%, and are superior to Lubricating Oils 2 to 4 that have heat resistance ranging from 37.6 to 38.3%. In view of the above, the lubricating oils of Examples 2 to 4 are significantly superior in heat resistance (Table I).

(b) On the other hand, Lubricating Oils 8 to 11 obtained in the current experiment according to the instant invention have a different diol-based structure (other components being the same as those of Example 4) from that of the lubricating oils of Examples 2 to 4; however, Lubricating Oils 8 to 11 have excellent heat resistance (evaporation amounts) ranging from 2.1 to 5.5%, and are comparable in other properties, when compared with the lubricating oils of Examples 2 to 4 (Table III). This reveals that instant Lubricating Oils 8 to 11 are comparable or superior to the lubricating oils of Examples 2 to 4 (Table I) in heat resistance and other properties.

6. I, the undersigned, declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: Oct. 7, 2008 By Yasuyuki Kawahara

Yasuyuki KAWAHARA